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THE INSECT PEST SURVEY
BULLETIN

A periodical review of entomological conditions throughout the United States
issued on the first of each month from March to December, inclusive.

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Volume 10

Summary for 1930

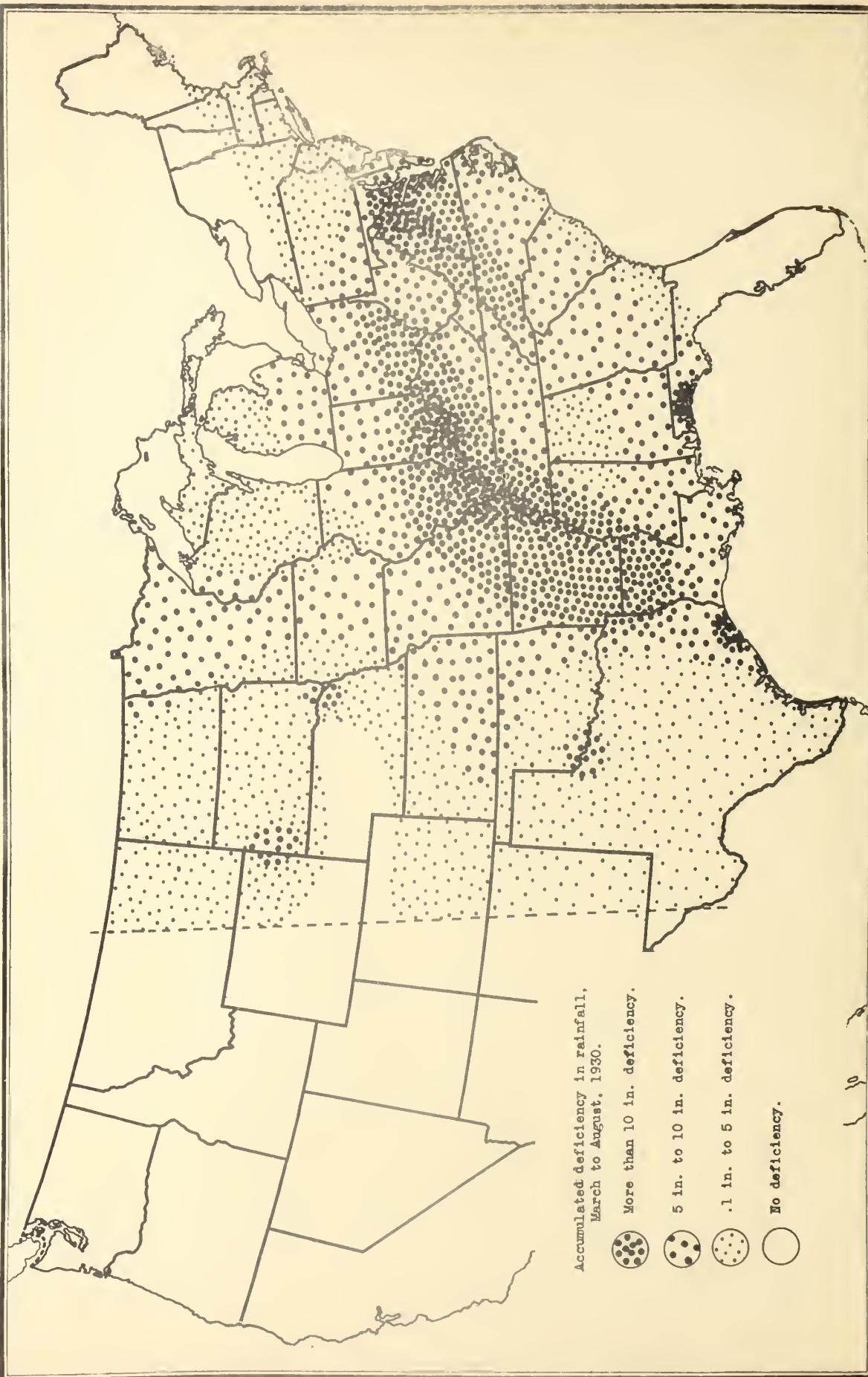
Number 10

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DEPARTMENT OF AGRICULTURE
AND
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INSECT PEST SURVEY BULLETIN

Vol. 10

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INTRODUCTION

The year 1930 had as its most conspicuous feature a prolonged and disastrous drought, probably the worst since 1901. All the country east of the Rockies except the extreme Northeast and Southeast was more or less affected; the Ohio River and lower Mississippi River Valleys, and Maryland and Virginia, suffered most. Water supply, as well as crops, was affected and economic effects were profound. It seems likely that effects upon insects and other animals, and upon plants, will be marked, and that they may in some cases persist several years. This effect has already become evident in the case of the Mexican bean beetle, the codling moth, the oriental fruit moth, and the European corn borer.

January was below normal in temperature over most of the country, especially in the West; a large area from northern Texas to eastern Washington was 10 degrees or more below normal. The cold was steady and snow cover was rather general, and winter grain suffered little. Rainfall was heavy in the lower Mississippi River and Ohio River Valleys. February was almost the reverse of January in temperature, with the prairie States far above normal; moisture was deficient in the Great Plains, the Rockies, and the south Atlantic region.

March temperature was near normal; but rainfall was variable, and deficient over most of the country. Seasonable rains failed to occur in the plains States, to the great detriment of winter wheat in the southern part. April was well above normal in temperature, especially in the Great plains; moisture was variable and generally deficient. The drought was relieved late in the month in many areas west of the Mississippi, but continued in the Ohio River and lower Mississippi River Valleys, and moisture became scanty in the Middle Atlantic States. May was marked by variable temperatures, averaging not far from normal; by deficient rainfall in the middle and south Atlantic region, the Ohio River and middle Mississippi River valleys, and the lower Great Lakes region, with more plentiful rains to the west and south, and excessive rainfall in the lower Mississippi River Valley.

June temperatures were not far from normal; rainfall was deficient in the Ohio River valley and almost absent in the lower Mississippi River

Valley, but was fairly well maintained elsewhere. July was very hot, with temperatures from 2 to 6 degrees above normal over most of the country, and rainfall was very scanty except on the southeast coast and in the southern Rockies. August was somewhat warmer than normal over most of the country, with variable and deficient rainfall. Some areas, especially in the Great Plains region, received good rains; but the drought continued to be severe in the Ohio River and lower Mississippi River Valleys, and in parts of the Middle Atlantic section.

During the fall months there has been partial relief from the drought in ~~most~~ places west of the Appalachians, but it continued severe in Maryland and Virginia. A cold wave late in November carried temperatures down to levels typical of mid-winter over most of the country east of the Rockies, but apparently caused no unusual damage.

GRASSHOPPERS

In spite of indications during the late fall of 1929, grasshopper damage in the Northwest did not prove to be at all serious. The only outbreaks of importance occurred in northern Michigan and northeastern Colorado during the early summer. As the summer advanced more serious outbreaks were reported from northeastern Colorado, northeastern Wyoming, southwestern Montana and parts of Nebraska, South Dakota, Oklahoma, and Arizona, with localized outbreaks in Utah and southern California. In the fall a serious outbreak developed in Idaho, and reports of minor damage were received from practically the entire northern half of the United States. During October very severe defoliation of young citrus occurred in many parts of Florida.

"The survey made in North Dakota indicates that although grasshoppers were only locally troublesome during 1930, their numbers are generally increasing over the western part of the State to such an extent as to make possible serious damage in 1931 if favorable spring weather conditions prevail." 1

"In western Montana more grasshoppers were present during the latter part of the summer than at any time since the series of bad outbreaks that began in 1917 and ended in 1925, according to a report of a survey.

In north-central Montana there is also a great increase in grasshopper populations. In the irrigated sections the red-legged grasshopper, (Melanoplus femur-rubrum DeG.) and two-striped grasshopper, (Melanoplus bivittatus Say) were dominating the situation. In the dry land sections the lesser migratory grasshopper, (Melanoplus mexicanus atlanis Riley) is decidedly on the increase and is approaching numbers similar to those which preceded the outbreak of 1922 to 1925, when this species devastated practically the entire area. In the eastern part of Montana grasshoppers were increasing but not to the point that a general outbreak was indicated. It is felt that 1931 will be a critical

1 R. L. Shotwell, Bureau of Entomology, U. S. D. A.

year from the standpoint of grasshopper abundance. In many localities enough eggs have been laid to provide for an enormous possible increase if weather conditions should prove favorable. On the other hand, it is entirely possible that unusually warm weather in April may cause premature hatching of the eggs, or that a prolonged period of wet weather after the normal hatching period may so reduce their numbers as to wipe out the gains in population made during the past season of weather favorable to them." 1

MORMON CRICKET

The mormon cricket (Anabrus simplex Hald.) appeared in very threatening numbers in Montana but by the end of July the outbreak was completely under control. The serious outbreak in northwestern Colorado has also been brought under practical control by cooperative action of the State of Colorado and the Bureau of Entomology. The outbreak which formerly covered rather extensive areas in Moffat and Routt Counties, Colorado, has now been reduced to the Blue Mountain section of Moffat County. This pest also damaged potatoes in Davis County, Utah.

WHITE GRUBS

Many reports of defoliation, particularly of pecan trees, by May beetles, were received from Georgia westward through the Gulf region, and the larvae of these insects were reported as unusually numerous in the North-Central States during May. Injury by white grubs continued to be serious in the North-Central States throughout the early summer from Indiana westward to Iowa and Nebraska and northward into southern Minnesota and Wisconsin. This damage continued to be reported until the close of the season.

WIREWORMS

Reports of damage by wireworms were received from Florida and Mississippi during April, and as the spring advanced reports were received from practically all parts of the country east of the Rocky Mountains. In south-central and southern Illinois several thousands of acres of corn was replanted on account of these insects, and similar damage occurred in parts of South Dakota. Wireworms attracted considerable attention in the irrigated districts of southern Idaho during May. Although the sand wireworm (Horistonotus uhleri Horn) did unusually severe damage to a variety of crops in South Carolina this year, the wireworm Monocrepidius vespertinus Fab. was conspicuously scarce in the bright tobacco district of South Carolina.

1 J. R. Parker, Bureau of Entomology, U. S. D. A.

"The wireworm Heteroderes laurentii Guer., which was first discovered in the United States in the fall of 1927, has become very abundant in certain sections of the Gulf Coast States. It is not known just when this insect was introduced, but scouting during 1930 has shown the insect present in the following States and counties: In Alabama in Baldwin and Mobile Counties; in Mississippi in Jackson, George, and Harrison Counties; in Florida in Escambia, Walton, Jackson, and Holmes Counties. All identifications of specimens from Florida have been made from larvae, since scouting was done there during the period when adults were not plentiful in the field. In the other States mentioned, adults as well as larvae have been collected. During 1930 the insect was very abundant in Baldwin and Mobile Counties, Alabama. Soil sifting has shown a population in some fields as high as 10 larvae per square foot in the top 4 inches of soil. The amount of damage or injury caused by the insect to various crops is very hard to determine, since observations along that line have not been completed. It is safe to say, however, that considerable damage is done where such a heavy population is found." 1

PLAINS FALSE WIREWORM

Similar to the conditions reported in 1929, the Plains false wireworm (Eleodes opaca Say) did very little damage throughout its entire range this season. It was reported as moderately abundant in wheat at Ulysses, Kans., and the beetles were observed in unprecedented numbers in the entire wheat area of the panhandle of Texas.

CUTWORMS

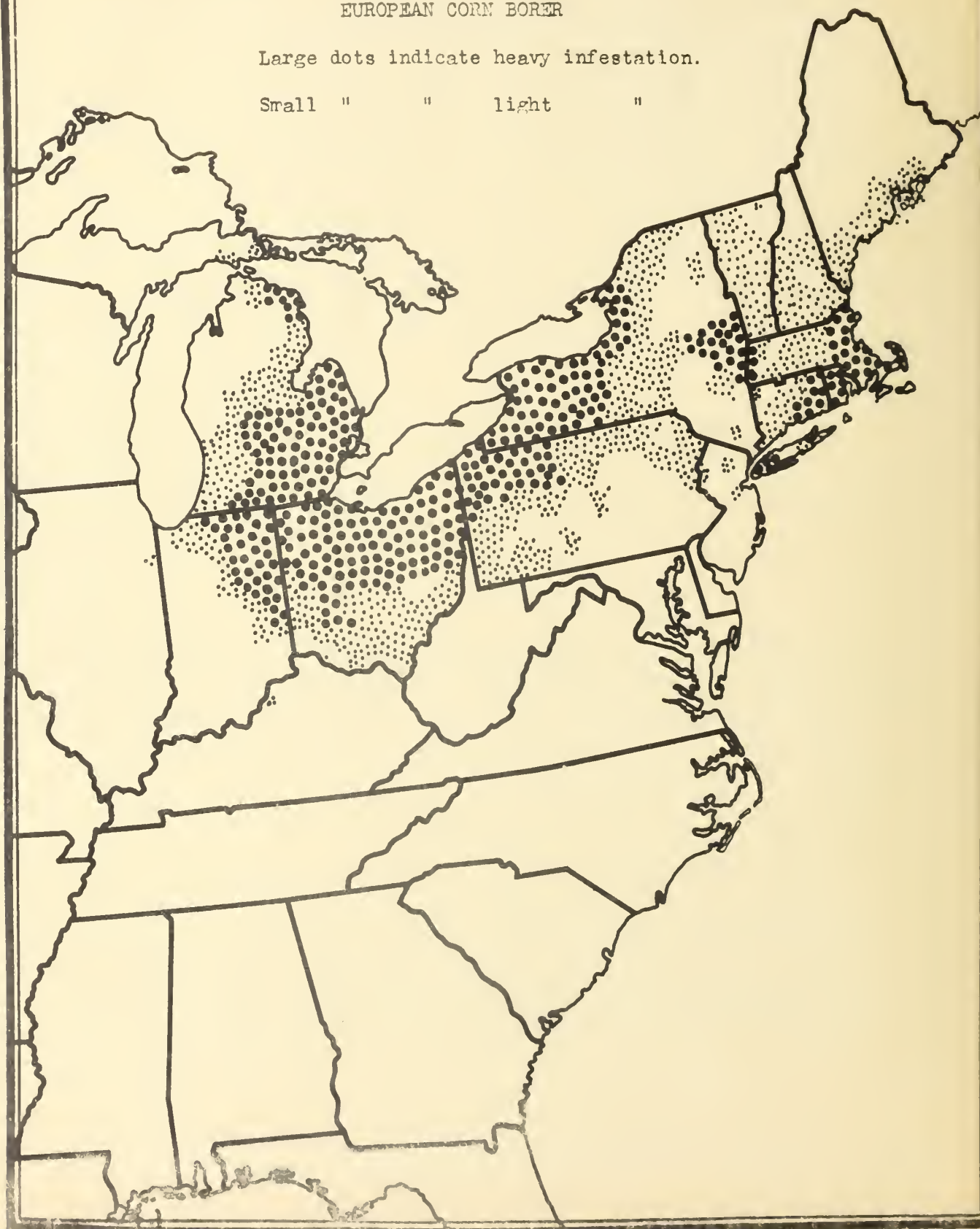
The pale western cutworm (Parosagrotis orthogonia Morr.) and the army cutworm (Chorizagrotis auxiliaris Grt.) were appearing in destructive numbers in several Western States from Oklahoma to Nebraska during late March, and other species were reported as appearing in unusual numbers in the Gulf region during that month. As the season advanced, the usual number of spring reports were received from practically all parts of the country. Toward the end of May damage by the pale western cutworm was reported from parts of Montana. These cutworm depredations continued until the early part of June, especially from the Dakotas and Nebraska, and westward into During the summer the variegated cutworm (Lycophotia margaritosa Haw.) rather severely damaged alfalfa in the southern tier of counties of Nebraska, and the black cutworm (Agrotis ypsilon Rott.) attacked corn and cotton in Mississippi. During the fall months this species seriously injured over 2,000 acres of lettuce land west of Phoenix, Ariz. During August the pale western cutworm was locally injurious in Utah, and the Bertha armyworm (Barathra configurata Walk.) occurred in outbreak numbers in the northeastern corner of North Dakota.

1 K. L. Cockerham, Bureau of Entomology, U. S. D. A.

EUROPEAN CORN BORER

Large dots indicate heavy infestation.

Small " " light "



EUROPEAN CORN BORER

"The spread of the European corn borer (*Pyrausta nubilalis* Hbn.) during 1930 was retarded by the drought. To the westward, the insect was discovered in a single new township of each of the following Indiana counties: Delaware, Fayette, Fulton, Hamilton, Porter, Pulaski, and Rush; it was also found in nine townships of Madison and Henry Counties. In Ohio it nearly or quite reached the Ohio River in Adams, Clermont, Gallia, and Meigs Counties and was found in new townships in Highland, Pike, and Jackson Counties. It also crossed the Ohio River into three districts of Lewis and Bracken Counties, Ky. New infestations were discovered in six townships in Mason, Wood, Ritchie, and Tyler Counties, W. Va.; in eleven townships in Lehigh and Northampton Counties, Pa.; and in eight townships in Warren, Hunterdon, and Essex Counties, N. J. The one-generation strain spread eastward in the northwestern part of Litchfield County, Conn., and the two-generation strain spread westward in Connecticut in Tolland, Hartford, and New Haven Counties, as well as extending along Long Island Sound into Fairfield County. The only infestations found outside of the States now under quarantine were those in Kentucky, along the Ohio River. It is believed that these outbreaks arose through spread by the river. The degree of infestation in the 1930 corn crop as compared to that of previous years, according to this year's survey, shows that there has been an average reduction in corn-borer abundance of approximately 25 per cent as compared to 1929. Decreases of approximately 21, 58, and 29 per cent were indicated for Michigan, Ohio, and Pennsylvania, respectively, and increases of approximately 33 and 11 per cent were indicated for Indiana and New York, respectively. These differences were brought about by variations in the drought conditions. The larval survival in 1930 on the corn at the European corn borer demonstration farm at Toledo was reduced to 4 per cent as compared to 25 per cent on the same variety of corn in 1929. The reduction appears to be due largely to the extremely hot, dry spring and summer, the heat being so intense as to prevent a considerable percentage of the eggs from hatching in many areas and causing the death of a large number of young larvae. In the two-generation area in New England, comprising Maine, New Hampshire, eastern Massachusetts, Rhode Island, and Connecticut, there has been a general decrease in infestation, although an increase occurred in a part of the area. In eastern Massachusetts Bristol, Middlesex, and Norfolk Counties show an increase, while Plymouth, Dukes, and Nantucket Counties show considerable decrease. In Rhode Island there is also a great decrease in infestation, which is largely due to good clean-up measures during the winter months, and unfavorable conditions for the first generation. Commercial damage to some extent in corn was observed in some of the counties in southern Massachusetts and Rhode Island, especially by the second generation. The commercial damage in the one-generation area in the Great Lakes section was very slight.

"Below is shown the status of infestation, by States, in 1929 and in 1930, in terms of the average number of borers per 100 plants.

One-generation area:

	<u>1929</u>	<u>1930</u>
Michigan	15.68	12.41
Indiana	.57	.76
Ohio	12.89	5.40
Pennsylvania	.96	.63
New York	9.21	10.23

Two-generation area:

	<u>1929</u>	<u>1930</u>
Connecticut	8.66	4.43
Maine	2.56	.01
Massachusetts	235.61	135.16
New Hampshire	11.74	1.43
Rhode Island	187.36	42.10 " 1

FALL ARMYWORM

During late June the fall armyworm (Lophygnathus frugiperda S. & A.) started attacks in outbreak numbers in the Gulf region and the South Atlantic States. The infestation in Florida was the most severe since 1912. Later in the summer this insect also did much damage in the Lower Rio Grande Valley of Texas and outbreaks were reported from other sections, and by fall it was quite generally prevalent over the Middle Atlantic and East Central States. Apparently the long, dry summer prevented the growth of succulent grass in pasture lands and caused the moths to lay their eggs on small patches of any green food available. As a result, hundreds of lawns were seriously over-run by an unusual number of caterpillars. Fall-sown wheat and other small grains which were planted for early fall pasture also became rather heavily infested.

VELVETBEAN CATERPILLAR

The velvetbean caterpillar (Anticarsia gemmatilis Hbn.) was very decidedly less troublesome this year in the Gulf region where the most serious outbreak on record was recorded last year. It appeared this year, however, in destructive numbers in some districts of Louisiana and Oklahoma.

CORN EAR WORM

During the latter part of April the corn ear worm (Heliothis obsoleta Fab.) was appearing in moderate numbers over the southern part of Florida. During May it was reported quite generally prevalent in the southern part of the Gulf States and in southern and central Texas. By the middle of July it was appearing in destructive numbers in the Carolinas and corn

being shipped into the Northern States from the Gulf region was found to be 40 per cent infested. During July more or less damage was reported from the southern half of the United States east of the Rockies. By October this insect was observed in noticeable numbers in southern New Hampshire for the first time since 1922 and at that time it was quite prevalent throughout the remainder of the New England and Middle Atlantic States. In the intensive truck-growing district of Long Island it was causing a loss of at least one-third of the crop of sweet corn. Generally heavy infestations during the fall were reported westward as far as Indiana, Kentucky, Michigan, Wisconsin, and Nebraska.

COTTON LEAF WORM

The cotton leaf worm (Alabama argillacea Hbn.) was prevalent in practically all fields in the lower Rio Grande Valley during the last week in June. It was not reported from the Gulf States until July. A very heavy infestation in south-central and southeastern Arizona resulted in an estimated loss of 30 per cent in the cotton yield. A northward flight of the moths started in September. By the 14th of the month the insect was reported from central Missouri, on the 15th in southern Illinois, by the 23rd of the month it had reached the District of Columbia, and the next day it was reported from southern Michigan and north-central New York. On September 25 it appeared in the Connecticut River Valley at Amherst and along the coast at Boston, and late in the month it appeared in southern Ontario, Canada. A second flight of these moths appeared in southern Illinois on October 13 and 14 and later in the month the moths did serious damage to late strawberries, apples, and pears in Wisconsin.

SUGARCANE BORER

Reports during the very early spring months indicated that the sugarcane borer (Diatraea saccharalis Fab.) had suffered heavy winter mortality in Louisiana. As the spring advanced the borer was found to be at a very low ebb in the Everglades district of Florida, only one point, near Sarasota, showing heavy infestation. By the middle of August the infestation was so low in Louisiana that the general infestation was estimated at not over 2 per cent of the stalks infested. At that time eggs were scarce and parasitism by Trichogramma minutum Riley was very high.

HESSIAN FLY

"The infestations of the Hessian fly (Phytophaga destructor Say) throughout the Middle Atlantic States, including West Virginia, Virginia, and North Carolina, are so light as to cause no anxiety to wheat growers this coming season, and, except for the State of New York, a slight decrease in the amount of Hessian fly infestation has been found." 1

"In general, infestation in the East or Central States was too light to affect yields, particularly in the northern portion of this region. While infestations ran noticeably higher in the southern portion, material injury was restricted to occasional fields, except in southern Illinois, where it was general in some localities. There did not seem to be much danger of serious infestation in the fall in southern Michigan and in the northern portions of Ohio, Indiana, and Illinois. The somewhat greater abundance of the fly in the southern parts of these States and in Kentucky and Tennessee, however, especially in some localities, made heavier infestations in the fall more likely in that region. However, later observations indicate that infestation is very low throughout this territory with the single exception of west-central Illinois, where infestations are severe. Parasitism is normal, which means that it is an important but not a controlling factor. From our general knowledge of conditions it is our opinion that the averages shown in Table 1 for southern Illinois, southern Kentucky, and southern Tennessee are much too high to represent the true situation." 1

"There was not as much gain in infestation in Missouri as was to be expected from the conditions of last fall (1929). The cause for this was apparently unfavorable weather conditions during the spring and early summer months. Infestations were noticeably higher in east-central and southwestern Missouri than elsewhere in that State. In general, less than 25 per cent of the wheat stems were infested, although in occasional fields infestation ranged high as from 42 per cent to 90 per cent. Only in such occasional fields was the united infestation by fall and spring broods high enough to affect the yield. The infestation in Kansas, in general was low. The yields were not measurably affected by the fly, except in two localities where the maximum infestations found in the State occurred. These localities were Hiawatha, in the extreme northeast, and Colby, in the extreme northwest portions, respectively. These high infestations, in both cases, represent sudden outbreaks of the fly at localities from which it has been almost totally absent for several years. Although the samples representing Hiawatha were taken from experimental fields only, these were not grown under conditions especially favorable to the fly; the highest infestations found in northwestern Kansas were from field samples. In Nebraska the infestation was, in general, exceptionally high for that State. The yields will probably be affected in most of the experimental plots. It is believed that at the only locality in which the infestations did not exceed 27 per cent of the culms, the lower infestation was due to systematic rotation of crops and general excellence of farming, together with comparative isolation from other wheat fields. The fly is, for all practical purposes, absent from Oklahoma wheat fields, except in the extreme northeastern portions. In the experimental plots of this section the infestation ranged from 19 to 38 per cent of the stems. There is reason to believe, however, that these plots are subject to local conditions which tend to keep the infestation abnormally high." 2

1 C.M. Packard, Bureau of Entomology, U. S. D. A.

2 J. R. Horton, Bureau of Entomology, U. S. D. A.



ALFALFA WEEVIL

Known distribution to December 31, 1930.

TABLE I. - Summarized figures on infestation by the Hessian fly.

<u>District</u>	<u>Per cent of</u> <u>straws infested.</u>	<u>District</u>	<u>Per cent of</u> <u>straws infested.</u>
New York (1) - - - -	5	Southern Michigan (3)	4
Pennsylvania (2) - - -	2	Northern Kentucky (3)	15
Maryland (2) - - - -	1	Southern Kentucky (3)	52
Delaware (2) - - - -	2	Northern Tennessee (3)	3
West Virginia,		Southern Tennessee (3)	28
panhandle (2) - -	1	Southern Missouri (4)	21
Virginia (2) - - - -	2	Central Missouri (4)	19
North Carolina (2) -	2	Northwestern Missouri (4)	14
Northern Ohio (3) - -	10	Southeastern Nebraska (4)	41
Southern Ohio (3) - -	18	Western Kansas (4) - -	14
Northern Indiana (3) -	7	Eastern Kansas (4) - -	10
Southern Indiana (3) -	17	Northern Oklahoma (4)	4
Southern Illinois (3) -	47		

GREEN BUG

Early in March the green bug (Toxoptera graminum Rond.) was reported as being very abundant in south-central Kansas, and during late June and early July it became more prevalent than in several years in parts of Minnesota, the Dakotas, Nebraska, and Colorado. Very considerable damage was done in many districts.

CHINCH BUG

The chinch bug (Blissus leucoconterus Say) has shown no unusual prevalence during the past year over the greater part of the chinch bug belt. However, in parts of Illinois, Missouri, and Oklahoma the insect seemed to be decidedly on the increase, and early in October a heavy flight to hibernating quarters was observed in Illinois. A small outbreak of this insect attacking St. Augustine grass was also reported late in the season from Fairfax, S. C.

ALFALFA WEEVIL

"The principal development of interest regarding the alfalfa weevil (Phytonomus rusticus Gyll.) has been the discovery that an overwhelming percentage of parasitism may be completely offset in its economic effect by weather conditions. It is also interesting to record that alfalfa

- (1) C. R. Crosby, Cornell University.
- (2) C. C. Hill, Bureau of Entomology, U. S. D. A.
- (3) C. M. Packard, Bureau of Entomology, U. S. D. A.
- (4) J. R. Horton, Bureau of Entomology, U. S. D. A.

weevils cannot be found by intensive search in the screenings from fall potatoes, and that there is a minimum of danger of including live weevils in alfalfa meal found in portable mills and blown into freight cars in bulk."¹

SOUTHERN CORN LEAF BEETLE

A rather unusual outbreak of the southern corn leaf beetle (Myochrous denticollis Lec.) was reported from Indiana. In one field 90 per cent of the corn was eaten off below the ground by these beetles. Similar damage was reported from Kentucky and from Clermont County, Ohio. It was also reported from Missouri.

CODLING MOTH

During the later winter months of 1929-30 it was evident that winter mortality of the codling moth (Carpocapsa pomonella L.) was extremely high in parts of Indiana and Illinois, in many places all of the larvae having been killed. Similar high mortality was reported from the Pacific Northwest and the Great Basin, but mortality of the larvae in the Pacific Northwest was recorded from above the snow line, and as there was considerable snow over this region the actual survival was above normal. By the latter part of March the larvae were starting to pupate in New Mexico. As the season advanced the second brood picked up very materially and by the middle of July they were emerging in threatening numbers in the East-Central States. The unusually hot, dry weather that prevailed over a great deal of the country seems to have stimulated this insect, and very severe late damage was reported from practically the entire drought area, and New York State, during August. On the other hand, in the Pacific Northwest late infestation was reported to be much below normal. Eggs continued hatching during the first two weeks of September in Indiana, Illinois, and Kentucky, and moths were still emerging during the third week of that month in central Ohio.

ORIENTAL FRUIT MOTH

"The Oriental fruit moth (Lasneyresia molesta Busck) was not on the whole so injurious during the season 1930 as during 1929, presumably on account of the unfavorable temperature conditions during the winter. It appears that the commercial peach districts east of the Mississippi River, and some west of the river, are now rather generally infested, though no recent actual survey to determine distribution has been made. At the Moorestown, N. J., laboratory special experiments were carried out with native parasites of this insect; these have resulted in a material increase in our knowledge of these beneficial insects. One species has been propagated in considerable numbers and distributed to various interested States. The entomologist sent to Europe to collect parasites of the

1 George I. Reeves, Bureau of Entomology, U. S. D. A.

ORIENTAL FRUIT MOTH

Known distribution up to December 31, 1930.



fruit moth has established headquarters at Antibes, France, and has thoroughly informed himself on the general fruit-moth situation in the region. One shipment of parasites from France has already been received and important shipments are expected another season. Further investigations of insecticides for the fruit moth in the laboratory and field have not shown any very hopeful results." 1

EASTERN TENT CATERPILLAR

The eastern tent caterpillar (Malacosoma americana Fab.) was about normal in New England and above normal in abundance in Virginia and southward. Eggs were observed hatching during the second week in March in Georgia and Arkansas and tents were being started during the latter part of that month in the South Atlantic States.

FRUIT-TREE LEAF ROLLER

During the very early spring months reports of large numbers of the fruit-tree leaf roller (Archips argyrospila Walk.) were received from Wisconsin, and late in June very heavy defoliation of oak was reported from practically the entire oak-forest area, some large stands being more than 70 per cent defoliated. As the spring advanced larvae were observed to be very plentiful in Michigan, especially near Grand Rapids. The insect was quite generally prevalent throughout both the Hudson River Valley and northern New York State and did considerable damage in a number of localities.

APPLE MAGGOT

The first adults of the apple maggot (Rhagoletis pomonella Walsh) appeared in the Hudson River Valley in New York the last week in June, at Durham, N. H., on July 5, in northern Ohio July 11, and Ames, Iowa, about the middle of July. This insect was collected in practically all of the apple-growing regions in Minnesota, where it was more abundant this year than usual. It did not cause any noticeable damage in New York State or northern Ohio. The first report of this insect from the northeastern part of Nebraska was received this year, the report coming from Knox County.

PLUM CURCULIO

Unusually large numbers of the plum curculio (Conotrachelus nenuphar Hbst.) went into hibernation in the fall of 1929 throughout the entire eastern part of the United States. On March 17 these insects began leaving hibernation quarters in large numbers in the Georgia fruit

1 A. L. Q uaintance, Bureau of Entomology, U. S. D. A.

belt, while up to the third week of March no adults had been seen in Delaware and Virginia and it was not until the middle of April that the first adults were observed in this region. This is extremely late for the Atlantic Seaboard, as adults emerged from hibernation about March 7 in 1929. The first weevils were observed in the trees in southern Illinois April 14 this year and April 6 in 1929. Egg-laying was well under way during the last week in April in Georgia. The first larva was observed to leave peach drops in the Fort Valley district of Georgia on April 28. This is about two weeks later than usual, and as a result no damage was done except to extremely late varieties of peaches in the Georgia fruit belt. In the East-Central States, particularly in the southern part, this insect seriously damaged apples during May. This is accounted for by the complete failure of the stone-fruit crop due to winter killing in this region. During June this insect appeared to be more prevalent than usual in the New England and Middle Atlantic States. Toward the end of the season a very considerable late injury was reported throughout the New England, Middle Atlantic, and East-Central fruit sections, while in the South this insect was less destructive than in previous years.

JAPANESE BEETLE

"Under the quarantine regulations for the Japanese beetle (*Popillia japonica* Newm.), in effect throughout the summer of 1930, the area designated as generally infested covered 25,592 square miles, extending from the vicinity of Baltimore, Md., and Harrisburg, Pa., to Newburgh, N. Y., and New Haven, Conn. Outside this area there occur a number of more or less isolated infestations in what is known as the lightly infested area. The latter covers 18,293 square miles, largely in Maryland, central Pennsylvania, and Connecticut. Scouting during the growing season of 1930 showed new infestations outside the regulated areas at Plymouth, New Bedford, and Attleboro, Mass.; Newport and Westerly, R. I.; Waverly and Buffalo, N. Y.; Lock Haven, Pittsburgh, New Castle, and five other points between Harrisburg and Pittsburgh, Pa.; Georgetown and Lewes, Del.; and Newport News, Portsmouth, and five villages in Accomac and Northampton counties, Va. In addition, the presence of infestation was determined at Boston, Mass., Providence, R. I., and Cape Charles and Norfolk, Va., where beetles had previously been discovered although these localities had not been brought under Federal quarantine regulations. Points in the lightly infested areas where Japanese beetles had not previously been discovered included West Springfield, Mass.; Groton, Enfield, Bradford, Danbury, and Terryville, Conn.; South Waverly, Lewisburg, Carlisle, and Boiling Springs, Pa.; and Hyattsville and Weyerton, Md. At a number of these points only one Japanese beetle was collected. The most pronounced increases in the number of beetles caught in traps at the outlying points of infestation were at Cape Charles and Alexandria, Va.; Hartford, Conn.; and Cambridge, Md." 1

1 Plant Quarantine and Control Administration, U. S. D. A.

JAPANESE BEETLE - 1930

Dense dots indicate generally infested territory

Sparse " " lightly " "

Large " " isolated infestations



ASIATIC BEETLE AND ASIATIC GARDEN BEETLE

"The abundance of the Asiatic beetle (Anomala orientalis Waterh.) and the Asiatic garden beetle (Aserica castanea Arrow) has been reduced by the drought during the past two summers. The Asiatic beetle has been affected more as it flies very little. In 1930 lawn-turf injury was reported at New Haven, Conn., and in New York at White Plains, New Rochelle, and Roslyn. Examination of conditions throughout the infested area shows that the Asiatic beetle will remain abundant during years when there is a drought summer if the soil is not so porous that all traces of moisture disappear. The extensive application of lead arsenate to lawns during the period from 1926 to 1930 has also helped to check the Asiatic beetle at many localities. The dense infestations of the Asiatic garden beetle have been reduced so that plant injury in 1930 was about one-third as great as in 1928. A large part of this reduction of dense infestations may be credited to the drought, but some is due to a migration. As a result, a much larger area has an abundant infestation than at any earlier period, and more extensive economic injury can be expected unless some checking factor holds down the abundance of the Asiatic garden beetle. In 1930 injury of a new type by grubs of the Asiatic beetle and the Asiatic garden beetle occurred in New York. They were found feeding in gardens upon the roots of bean, beet, corn, onion, rhubarb, and strawberry plants. They were very destructive to strawberry beds and young vegetables." 1

SAN JOSE SCALE

During the winter months of 1929-30 surveys in several States indicated that in the Middle Atlantic region and the southern part of the East-Central States the San Jose Scale (Aspidiotus perniciosus Comst.) seemed to be slightly on the increase while in the northern parts of this region winter mortality was high. North of East St. Louis, Ill., only 2 per cent of the scale survived. The first crawlers were observed in Indiana on June 1 and in Washington State on June 10. This insect very materially increased in central and southern Illinois, which is believed to have been due to the hot summer and mild fall.

EUROPEAN RED MITE

Early observations in 1930 indicated that the European red mite (Paratetranychus pilosus C. & F.) was increasing in abundance in the East Central States, particularly in the northern part, but it was decidedly less abundant than usual in the New England and Middle Atlantic States. This insect was rediscovered in Utah in August, 1929, after a lapse of five years since it was last observed in that State. It has also recently become established in central California. The very dry weather which prevailed over much of the eastern part of the United States during July and August resulted in a decided increase in all red spiders.

1 H. C. Hallock, Bureau of Entomology, U. S. D. A.

A red spider destroyed 50,000 acres of wheat in Cimarron and Texas Counties, Okla., during April and May.

FRUIT APHIDS

During the winter months of 1929-30 fruit aphid eggs seemed to be below normal in abundance in the Eastern States, and these insects were not nearly so abundant in this region as they were last year. Eggs of the apple grain aphid (Rhopalosiphum prunifoliae Fitch) were reported as quite plentiful in parts of Missouri. The weather and enemies apparently checked the outbreak. Eggs started hatching in Delaware, central Illinois, and Ohio the last of March. The rusty plum aphid (Hysteroneura setariae Thos.) appeared in threatening numbers in the Fort Valley district of Georgia and in southern Mississippi during May. This species was also recorded at that time from Nebraska and Utah.

RASPBERRY FRUIT WORM

The raspberry fruit worm (Byturus unicolor Say) was somewhat prevalent in the Hudson River Valley and also in western New York. It was quite injurious in southwestern Michigan and the St. Paul district of Minnesota.

"In Washington State beetles were much more numerous this spring than formerly near Puyallup, but the actual amount of infestation in the loganberries was less than it has been in the past three years. An estimate of approximately 15 per cent loss occurred in the crop this season. The infestation in the raspberries was perhaps more general than before, but owing to the fact that the larvae seldom stick in the berries when picked, little attention was paid to them in this crop!" 1

MEDITERRANEAN FRUIT FLY

"The only findings of the Mediterranean fruit fly (Ceratitis capitata Wied.) in the continental United States during the past fourteen months were as follows: One infested sour orange containing four larvae about 10 miles west of Orlando, Fla., on November 16, 1929; two infested sour oranges containing ten larvae at Orlando on March 4, 1930; and two pupae in the soil under a fallen orange at St. Augustine on July 26, 1930. Meanwhile, from 300 to over 600 inspectors have been searching for infestation and during the past year have turned in for identification over 600,000 specimens, almost all of them Diptera found in ripe or decayed wild and cultivated fruits." 2

- 1 W. W. Baker, Washington Agricultural Experiment Station.
- 2 Plant Quarantine and Control Administration, U.S.D.A.

"There has been about the usual prevalence of the Mediterranean fruit fly (Ceratitidis capitata Wied.) in the Hawaiian Islands, as indicated especially by the wormy fruits of mango, guava, and papaya that are allowed to become fully ripened on the tree. The introduced parasites continue about the same extent of control as has been reported for the past several years, i.e., about 55 per cent of the maggots are killed by them." 1

ORANGE MAGGOT

"The only infestations of the orange maggot (Anastrepha ludens Loew) in the United States determined between April, 1929, and the time of the preparation of this report in October, 1930, consisted of larvae found in the fruit of three backyard plantings in the city of Brownsville, Texas, on November 19, 1929. The insect was found to be present, however, on more than one hundred properties across the Rio Grande in Matamoros, Mexico. The infestations on both sides of the river appear at present to have been wiped out by the prompt spraying and clean-up measures which were carried out during the following winter and spring, but infested fruit from the interior of Mexico is still being sold on the markets of Matamoros." 2

CITRUS APHID

The green citrus aphid (Arhis spiraeicola Patch) was more abundant on citrus in parts of Florida than it had been for several years. By the last of March the infestation had practically cleared up, owing apparently to very heavy rains. The infestation started to build up again in central Florida during June. During June outbreaks of rather severe proportions of various other aphids were reported from many parts of the northern United States.

PARLATORIA DATE SCALE

"The date-growing areas in which the Parlatoria date scale (Parlatoria blanchardi Targ.) is or has been present are the Coachella Valley and the Imperial Valley of California, the Salt River Valley and the Yuma District of Arizona, and the vicinity of Laredo, Texas. In the Coachella Valley, during the fiscal year 1929, 430 infested palms were found on 27 properties. In the year ended June 30, 1930, intensive inspection and clean-up work was conducted on these same properties, and 59 infested palms were found on 12 of the 27 properties, the others being apparently free from infestation. No infestations severe enough to be classed as "centers of spread" have been found in this valley since August 19, 1929, when the first intensive inspection was completed. In

- 1 O. H. Swezey, Hawaiian Sugar Planters' Association.
- 2 Plant Quarantine and Control Administration, U. S. D. A.

the Imperial Valley, work was confined during the fiscal year 1930 to the southern part of the county, the only area in which infestation had previously been found. Ninety-two infested palms were discovered on 30 properties as contrasted with 1,115 infested palms found on 60 properties during the previous year. In the vicinity of Phoenix in the Salt River Valley of Arizona, 27 infested palms were found during the fiscal year on 5 properties, as contrasted with 43 infested palms found on 12 properties in 1929. In the Yuma District, 8 infested palms, all ornamental, were found on 3 properties during the year. Commercial plantings in this area were kept under observation but no scale was found in them. The *Parlatoria* date scale has not been found in Texas for a number of years" 1

CITROPHILUS MEALYBUG

The situation with regard to the citrophilus mealybug (*Pseudococcus gahani* Green) in southern California was more favorable than it has been any year since the insect became a major pest in that section of the State. Only a very small percentage of the properties were reported as heavily infested.

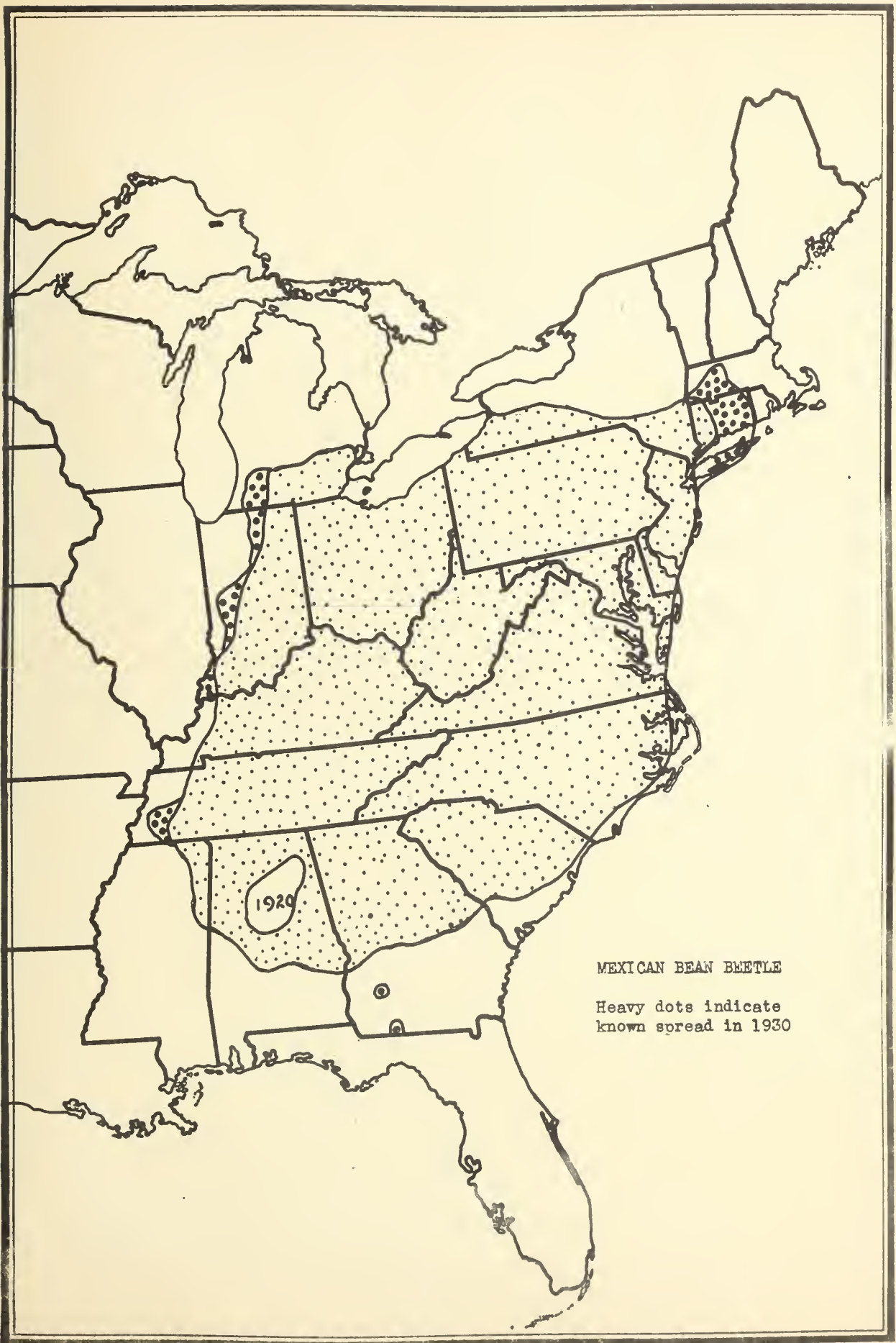
OTHER CITRUS INSECTS

The dry weather that prevailed over parts of Florida was accompanied by decided increases in the populations of the Florida red scale (*Chrysomphalus ficus* Ashm.), the purple scale (*Lepidosaphes beckii* Newm.), and the citrus whitefly (*Dialeurodes citri* Ashm.). The reporter believed that the lack of humidity prevented the development of the entomogenous fungi which normally check these pests.

MEXICAN BEAN BEETLE

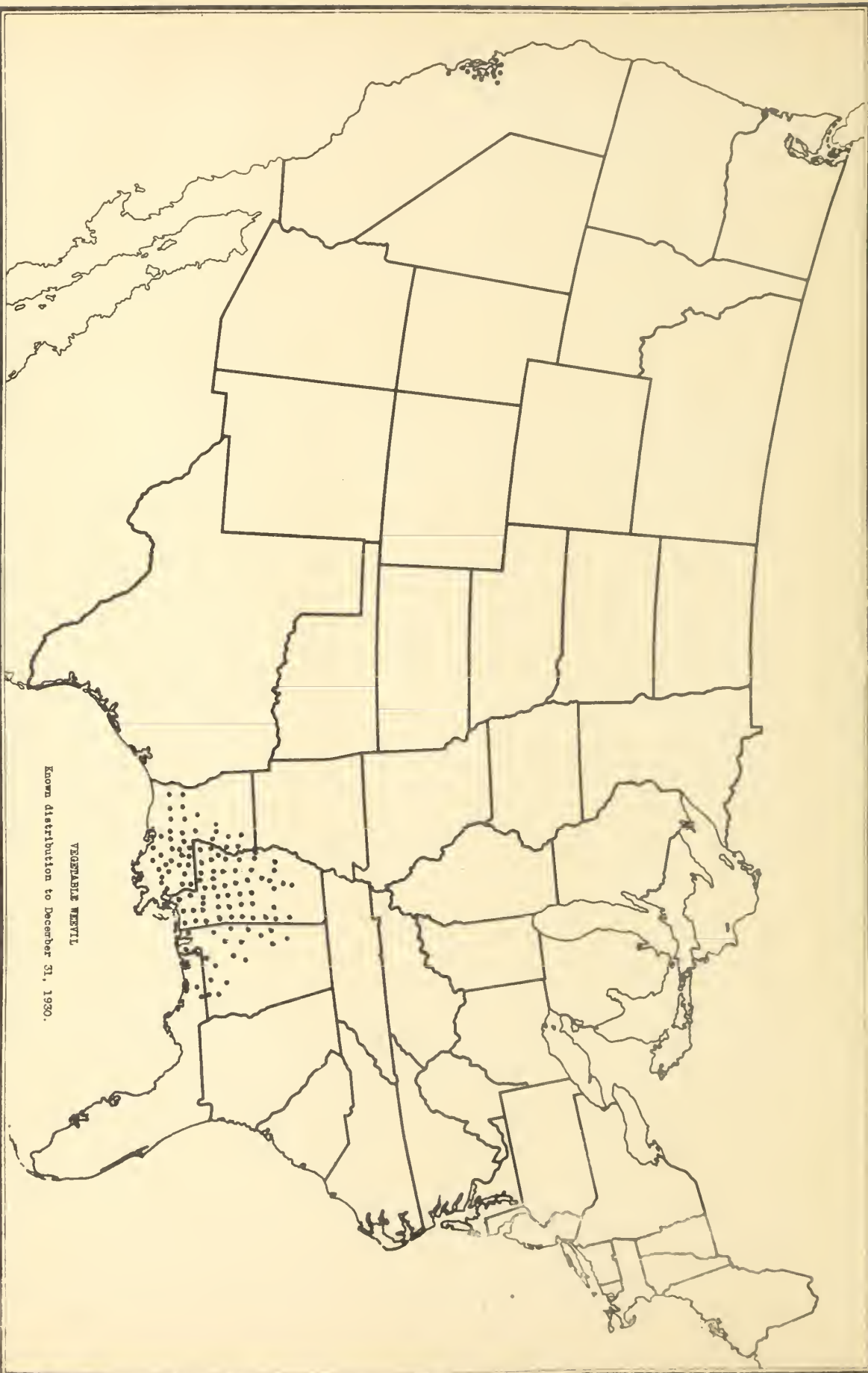
The Mexican bean beetle (*Epilachna corrupta* Muls.) was observed emerging from hibernation in the Norfolk district of Virginia and in Delaware during the first week in May. During the last week in May and the first two weeks in June the insect was observed throughout the northern part of the territory known to be infested. Throughout early July, the insect was quite generally reported throughout the infested territory, though infestations in the northern part of its range did not seem to be so serious as they were in 1929. The hot, dry weather that prevailed over a large part of the eastern part of the United States appears to have been very destructive to this insect and over much of the territory it practically disappeared as an economic factor. In Massachusetts the insect was found during the year to be well distributed over the Connecticut River Valley district northward into Hampshire County and has been found in a few instances in Franklin County. Otherwise, there was but little extension of the territory known to be infested.

1 Plant Quarantine and Control Administration, U. S. D. A .



MEXICAN BEAN BEETLE

Heavy dots indicate
known spread in 1930



VEGETABLE WHEAT.

Known distribution to December 31, 1930.

COLORADO POTATO BEETLE

The first adult of the Colorado potato beetle (Leptinotarsa decemlineata Say) was observed near Yazoo City, Miss., on March 20, and in the Charleston district of South Carolina on April 5, and at Columbus, Mo., on April 21. The prolonged drought was reflected during May along the Atlantic seaboard by a rather unusual abundance of this insect from North Carolina to New York. During the third week in May this insect was found in St. Johns County, Fla., this being the second record that this insect has occurred so far south in that State. During July the insect was found in Canyon County, Idaho, a previously uninfested county. A single specimen was collected in Davis County, Utah, this year. It has not been observed in Utah for several years.

VEGETABLE WEEVIL

The vegetable weevil (Listroderes obliquus Gyll.) was first recorded this year on January 25 in Lawrence Co., Miss. At that time it was doing serious damage to turnips. During the first half of February considerable damage in hotbeds and coldframes was reported throughout the infested territory in Mississippi and Louisiana. Reports of similar damage continued throughout March, April, and May. As the season advanced, damage in the field became more prevalent, being most serious on tomatoes, turnips, and carrots.

" During the calendar year 1930 the vegetable weevil has been found in 33 new counties and parishes, and is now known to occur in 118 counties in four Gulf States. Mississippi leads with 56 known infested counties; Louisiana comes second with 40 known infested parishes; Alabama third with 19 infested counties, and Florida fourth with 3 counties known to be infested.

" The dispersion of the weevil northward has not been so rapid during the past year as the year before, but its spread eastward and westward has been fully as rapid as before. The weevil is now present in at least 2 parishes bordering on Texas, in Richland parish or just one county south of the Arkansas line, and in Yalobusha county or two counties from the Tennessee line.

" A few new wild host plants were found during the year, but with one exception the infestation was light." 1

This insect is now known to occur in parts of ten counties in the San Francisco Bay district of California.

1 M. M. High, Bureau of Entomology, U. S. D. A.

SWEET-POTATO WEEVIL

"Damage by the sweet-potato weevil (Cylas formicarius Fab.) has been less this season in Mississippi and Alabama than in previous years, and there has not been a single report of a severe or heavy infestation. Most of the farms show only one or two hills infested. During the year only 38 infested farms were found in Mississippi and 2 in Alabama, located as follows: 12 in Pearl River County, 6 in Hancock County, 14 in Harrison County and 6 in Jackson County, Mississippi and 2 in Mobile County, Alabama. This is the lowest total number of infested farms reported for a year's work since this project was undertaken. No weevils have been found in George County, Mississippi, for three years." 1

IMPORTED CABBAGE WORM

The imported cabbage worm (Pieris rapae L.) was much more abundant this year than usual in the East-Central States, and in Wisconsin, Mississippi, and Utah, and the cabbage looper (Autographa brassicae Riley) did very considerable damage in the Southern States from Texas eastward to Illinois, Virginia, and the extreme southern part of the Eastern Shore of Maryland.

The cabbage webworm (Hellula undalis Fab.) became extremely abundant in the Gulf Coast district of Mississippi, completely destroying several hundred acres of turnips.

POTATO TUBER WORM

The potato tuber worm (Phthorimaea operculella Zell.) was unusually prevalent on the Department of Agriculture Farm at Arlington, Va., this year and also on the Eastern Shore of Maryland and Virginia. A report of this insect was received from Frederick County, Md., being the first report from the western part of the State. The eggplant leaf miner (P. glochinella Zell.) a closely related species caused a 40 per cent loss of the tomato crop in San Diego County, Calif., this year. This insect is present in Los Angeles and Orange Counties but it is not doing so much damage there.

CABBAGE APHID

During the first part of February the cabbage aphid, (Brevicoryne brassicae L.) was observed in unusual numbers in the Salt River Valley of Arizona. During the first week of March it did considerable damage in the Lower Rio Grande Valley of Texas. Early in March it became extremely abundant in southern Alabama and Mississippi necessitating control measures. As the spring advanced it occurred in such numbers in the truck-growing district of Virginia as to cut down the yield of seed kale about 50 per cent. Later in the season it was reported from the entire northern

1 K. L. Cockerham, Bureau of Entomology, U. S. D. A.

part of the eastern United States from Virginia and Maryland westward to the Dakotas and Nebraska. It caused considerable commercial damage in Virginia, Maryland, Illinois, and Wisconsin.

TURNIP APHID

The turnip aphid (Rhopalosiphum pseudobrassicæ Davis) was unusually abundant in the trucking district of Virginia and in a small district near Phoenix, Arizona, during late February. This insect seriously injured turnips during March in Louisiana and southern Mississippi. It was also reported, during the latter half of June, from Nebraska. During later June it seriously damaged turnip in parts of Ohio and kohlrabi and radishes during May in the Norfolk district of Virginia.

PEA APHID

The pea aphid (Illinoia pisi Kalt.) appeared the middle of February, which is about two months earlier than usual in the Gainesville district of Florida. It started to infest alfalfa in Arizona in February and peas in a trucking district of Virginia late in March. It seriously damaged red clover and cowpeas in Illinois in June. It appeared in large numbers by the third week in April in Kansas, by the third week in May was seriously injuring alfalfa in Kentucky, and by this time it was worse on the Eastern Shore of Maryland than it has been for many years. It was found in many alfalfa and pea fields during late May and early June in Minnesota and was found heavily infesting alfalfa the last half of June in Nebraska. In late May it was collected on cannery peas in Ohio. This insect appeared in large numbers in the important pea-canning district of Wisconsin during late June but by a combination of the hot weather of the summer and a very unusual number of parasites and predators it is believed to have been practically eliminated during the latter part of the summer. This species was also reported as seriously damaging alfalfa near Fresno, Calif., and in Utah and Nevada.

SQUASH BUG

The squash bug (Anasa tristis DeG.) did very considerable damage in large cantaloupe and squash plantings in the San Fernando Valley, Calif. It was also reported in unusual abundance in the Chicago trucking district of Illinois, where it has not been a pest for the last four years. Injury was also reported from southern New York, Indiana, northwestern Iowa, central Missouri, and eastern and southern Nebraska. The insect was reported for the first time from the State of Idaho this year, the specimen on which this report was based was collected in 1929.

HARLEQUIN BUG

The harlequin bug (Murgantia histrionica Hahn) began emerging in rather large numbers during the second week in April in Alabama. This insect became unusually prevalent from Mississippi eastward to the Carolinas. This condition prevailed throughout the remainder of the summer and well into fall, when serious damage was done to cabbage and turnip in Missouri. Observations in the Norfolk district of Virginia indicate that even this far north this insect does not truly hibernate but comes out whenever the temperature rises during the winter months.

BEEF LEAFHOPPER

"The beet leafhopper (Eutettix tenellus Baker) did serious damage to beets in southern Idaho, the damage decreasing in severity toward the eastern part of the State, where little injury was experienced. White beans in the western part of the Idaho bean territory and in western Washington also suffered. Some severe injury to beets occurred throughout central Utah and western Colorado, where tomato yields were also seriously affected. A variety of truck crops in western Oregon were injured in varying degrees. Injury in California was relatively slight, although some commercial losses were apparent. Populations of the beet leafhopper in New Mexico and southern Colorado were higher than in either of the past two years. Late reports indicate large populations in the desert breeding grounds in Utah and Idaho." 1

SEED CORN MAGGOT

The seedcorn maggot (Hyalemyia cilicrura Rond.) again became destructive to potato seed pieces of the early planted crop and to beans in the coastal district of the Carolinas and southern Virginia. This accompanied delayed germination owing to cold weather. Reports of similar trouble were received from many points in the East-Central, West-Central, and North-Central States during May and early June. This insect also did considerable damage by eating out melon seeds in Utah during a period of cool, cloudy weather.

ONION THRIPS

During midsummer considerable damage by the onion thrips (Thrips tabaci L.) was reported from New York, Virginia, North Carolina, Indiana, Illinois, Iowa, Mississippi, and Utah.

1 P. N. Annand, Bureau of Entomology, U.S.D.A.



PINK BOLL WORM

Area under regulation
(Not actual distribution)

BOLL WEEVIL

"Owing to hot and dry weather extending throughout practically the entire growing season in all States west of Georgia, the population of the boll weevil (Anthonomus grandis Boh.) was held below the point of serious damage to the 1930 cotton crop except in some small local areas and in about twelve counties in extreme southern Texas, including the Rio Grande Valley, where injury was more than usual. In Georgia the infestation was general and caused more or less damage except in the northwest district. In North Carolina weevils were fairly abundant, necessitating the use of control measures in most districts but were not so numerous as in 1929 owing to the dry, hot weather. In South Carolina infestation in the northern district was checked by hot, dry weather, but was sufficiently serious to warrant the use of control measures to a greater extent than in the season of 1929, while in the Coastal Plain district a high degree of infestation developed early and continued to increase as the season progressed, requiring the use of control measures in most counties in that area." 1

PINK BOLL WORM

"In the summary for 1929 as published in Volume 9, Number 10, of the Insect Pest Survey Bulletin, the discovery of larvae of the pink boll worm (Pectinophora gossypiella Saund.) in the Salt River Valley near Mesa, Ariz., was reported. The intensive inspection which followed this discovery disclosed infestation in a considerable number of fields in this general vicinity. Following the delimitation of the infested area, two non-cotton zones were established. These zones included some 40,000 acres of cotton. One of these zones at its greatest length and greatest width is 16 miles and includes the towns of Mesa, Chandler, and Gilbert. The other zone is 5 miles square and is located northwest of the village of Sacaton. No cotton was produced in these areas during the summer of 1930. Beginning with the crop of this year a new method has been employed in the scouting and inspection work done on account of the pink boll worm. A machine has been devised which serves to very greatly reduce the volume of gin trash from the first cleaner and has made it possible to examine a considerable portion of the first cleaner trash from gins throughout the area regulated on account of this insect. Gin trash machines have also been operated in a few localities outside of the regulated area. The inspections have failed to disclose the presence of the pink boll worm at any point outside of the regulated area. Likewise, the intensive inspections have failed to reveal the presence of the pink boll worm in certain counties of the Western Extension, (western end of cotton belt), where worms were found during 1927. Failure to find infestation in those parts of the regulated area included in Martin, Glasscock, Dawson, Howard, and Borden Counties, and in a small part of the northeastern portion of Midland County, has led to the amendment of the quarantine which removed these areas from the restrictions. The

inspections have shown the continued presence of the pink boll worm in all other cotton growing areas to be confined to the regulated area. The infestation in many of these areas is very light, and it is probable that infestation would not have been discovered in all areas by the old method of inspection. Light infestations have likewise been found in a number of points in Arizona outside of the non-cotton zone. These points are, with two exceptions, all within the restricted zone which surrounds the non-cotton zone. The infestations within the restricted zone are located within the vicinity of Lehi and Goodyear. A light infestation was also discovered about 3 miles southwest of Tempe and one specimen was found northwest of Phoenix, in the vicinity of the town of Glendale. A very light infestation has likewise been disclosed in the new cotton development in the vicinity of Coolidge. The infestations in this area have so far been traced to five fields included within a crescent-shaped area approximately 5 miles long. Although the new finding in Arizona involved considerable additional area, a comparatively few specimens have been found even by the intensive inspections employed. A rather heavy infestation was found on a desert ranch about 5 miles east of the easternmost limit of the cultivated area in the Salt River Valley. The production of cotton on this isolated ranch, which contains approximately 37 acres of cotton, was unknown until this autumn." 1

PERIODICAL CICADA

Brood IV of the periodical cicada (Tibicen septendecim L.) appeared during 1930 in the following counties:

IOWA

Adair, Adams, Appanoose, Cass, Clarke, Davis, Decatur, Fremont, Guthrie, Lucas, Mills, Monroe, Montgomery, Page, Ringgold, Shelby, Taylor, Union, Van Buren, Wayne.

KANSAS

Allen, Anderson, Atchison, Bourbon, Brown, Butler, Chase, Chautauqua, Cherokee, Clay, Coffey, Cowley, Dickinson, Doniphan, Douglas, Elk, Franklin, Geary, Greenwood, Jackson, Jefferson, Johnson, Labette, Leavenworth, Linn, Lyon, Marion, Marshall, Miami, Montgomery, Nemaha, Neosho, Osage, Pottawatomie, Riley, Saline, Sedgwick, Shawnee, Sumner, Waubesa, Wilson, Woodson, Wyandotte.

MISSOURI

Andrew, Atchison, Barton, Bates, Benton, Bollinger, (perhaps a 13-year colony), Boone, Buchanan, Caldwell, Carroll, Cass, Cedar, Chariton, Clark, Clay, Clinton, Cole, Daviess, DeKalb, Grundy, Gasconade, Gentry, Harrison, Henry, Holt, Jackson, Johnson, Knox, Lafayette, Linn, Livingston, Marion,

PERIODICAL CICADA

Known distribution of Brood IV up to and including its appearance in 1930.

Black dots indicate 1930 records.



Mercer, Nodaway, Pettis, Pike, Flatte, Putnam, Ralls, Ray, St. Clair, Saline, Schuyler, Shelby, Vernon, Worth.

NEBRASKA

Cass, Douglas, Johnson, Nemaha, Otoe, Pawnee, Richardson, Sarpy.

OKLAHOMA

Carter, Comanche, Craig, Noble, Osage, Pawnee, Payne, Pottawatomie, Roger, Stephens, Tulsa.

TEXAS

Fannin.

GYPSY MOTH

"The continued intensive inspection of the area in New Jersey where cooperative eradication work has been carried on by the State and the Federal Government against the gypsy moth (Forthetria dispar L.) since 1920 failed to reveal the presence of this insect during 1930. The close examination which is being given to areas formerly known to be infested is progressing satisfactorily although considerable work remains to be done to insure complete eradication of the insect in that State. A single live eggcluster was found on a tree at Interlaken, N. J., in March, which was shipped to that point from Roslyn, Long Island, N. Y. Interlaken is not located in the area where intensive work is being done. The eggcluster was treated and careful scouting for a considerable distance around the locality where the tree was planted failed to disclose any additional infestation. As a precaution, the area and surroundings were thoroughly sprayed in June and no trace of the insect has been found. The number of infested locations in the barrier zone, an area approximately 30 miles wide, extending from the Canadian border to Long Island Sound along the New England States and New York boundaries, was greater than last year. Most of the infestations were located in the section of the zone in south-western Massachusetts, northwestern Connecticut, and the territory adjoining it in New York State. A large proportion were found in woodland areas. Clean-up and exterminative treatment was applied to all the infestations in order to destroy the insect in these localities. Since the barrier zone was established in 1923 in cooperation with the States concerned, no serious spread to points beyond this protective area has been reported. At the beginning of the year an infestation of considerable extent was found on Long Island, N. Y., centering at one of the nurseries at Roslyn. Vigorous measures were taken at once by the authorities of the State of New York and the Federal Government to exterminate this infestation. It was necessary to trace a large number of shipments of nursery stock which had been sent from the infested area on Long Island to various points to be sure that the insect had not become established in this way. As a result of this tracing, a very small number of live eggclusters were found at three points on Long Island and at one point in New Jersey. By

reason of the intensive exterminative measures applied by State and Federal agencies, it is believed that all of these minor incipient infestations have been eradicated. Conditions in the generally infested central and eastern parts of the area in New England were improved over the previous year. Defoliation, as compared with the previous year, was considerably reduced although large areas were defoliated in many sections of the territory." 1

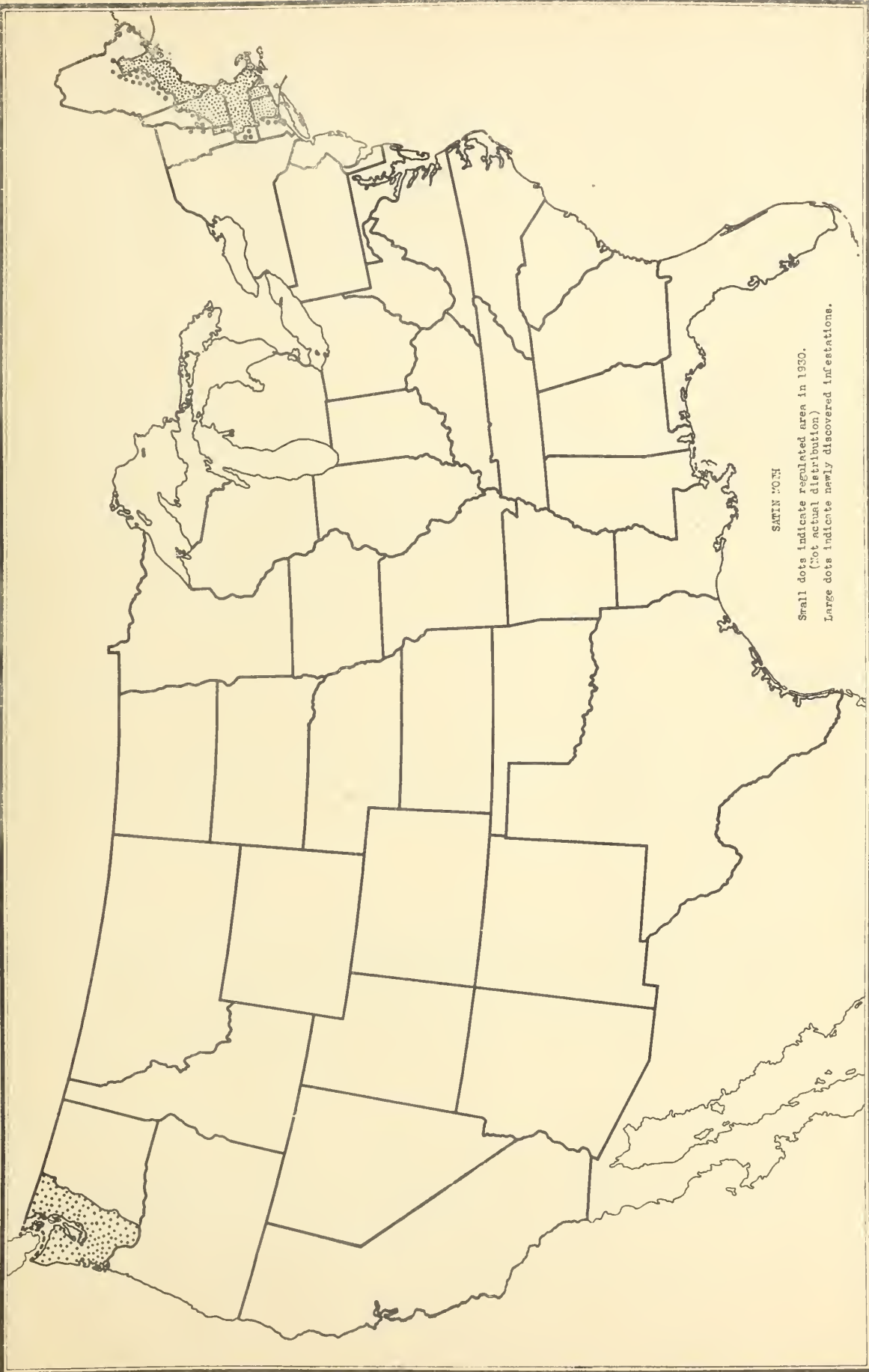
SATIN MOTH

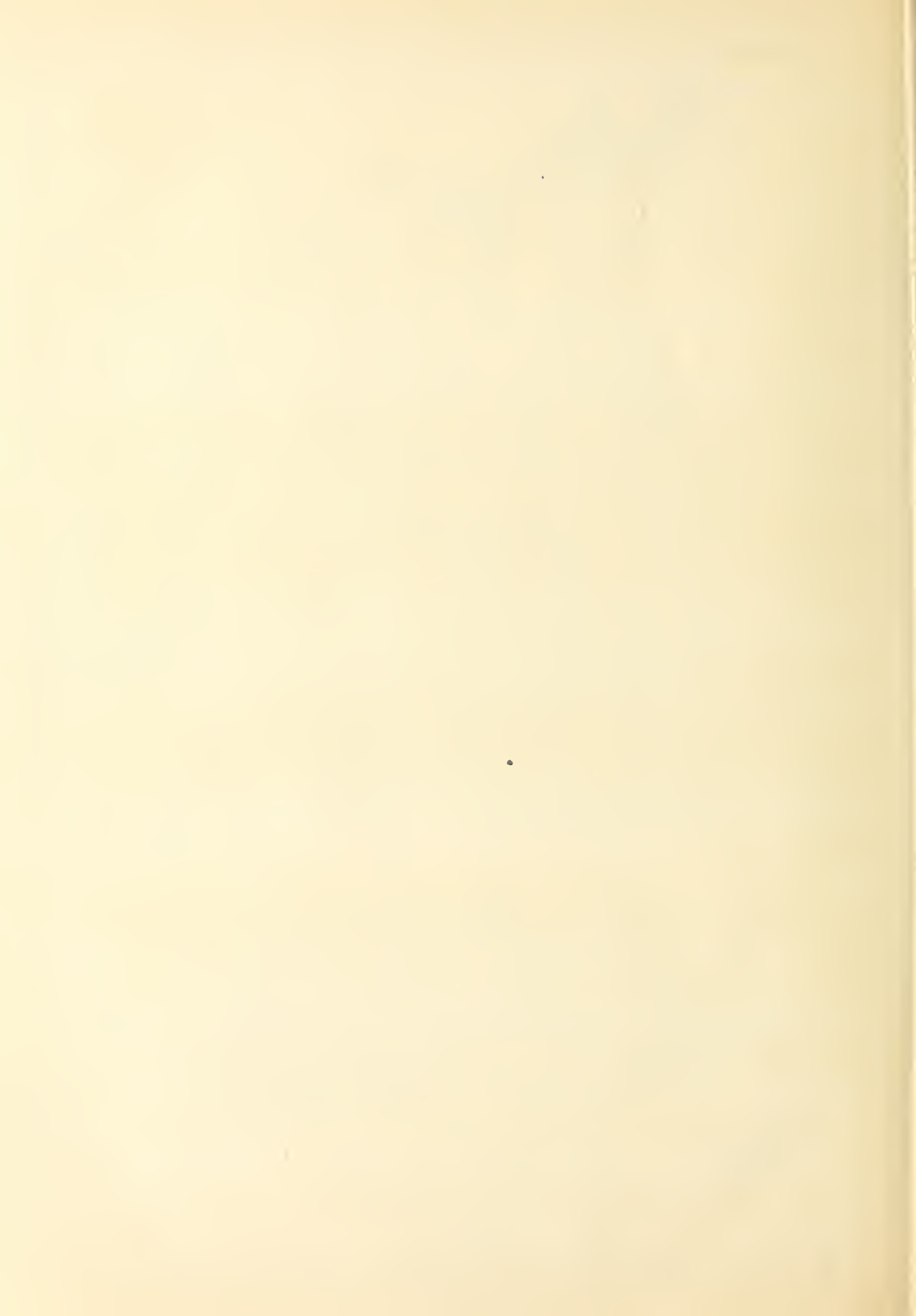
"There was appreciable spread by the satin moth (Stilpnotia salicis L.) in the New England area during 1930, beyond the previously known limits of infestation. This enlargement of the area occurred principally in parts of the following counties: New Haven, Middlesex, and Hartford Counties, Conn.; Hampshire and Berkshire Counties, Mass.; Windsor and Orange Counties, Vt.; Sullivan and Grafton Counties, N. H.; and Oxford, Franklin, Somerset, Piscataquis, Penobscot, and Washington Counties, Me. This new area, together with unsurveyed territory would embrace approximately 9,000 square miles in addition to area previously quarantined. This insect was reported for the first time last year as defoliating poplar trees in woodland in New England. During 1930 several defoliated areas were reported in woodlands located between Manchester and Concord, N. H., and also in the vicinity of Exeter, N. H. In general the infestation by this insect in New England appears to be increasing in density in certain districts and is steadily expanding the area which it occupies. This insect was reported for the first time in New Brunswick and Nova Scotia by assistants of the Dominion Entomologist. A number of locations extending roughly from Yarmouth to Annapolis Royal, Nova Scotia, were found, together with a somewhat larger number in New Brunswick, including one at St. Andrew which is located on the international line south of Calais, Me., at Fredericton and Moncton, together with a number of towns surrounding the latter city." 1

BROWN-TAIL MOTH

"The brown-tail moth (Nyctia rhacourhoea Don.) has not been seriously abundant except in southern New Hampshire and in some isolated areas in Maine and eastern Massachusetts. Severe defoliation occurred in many districts of southern New Hampshire, particularly from Concord southward, including territory east of the Merrimac River and extending nearly to the seacoast. Small defoliated areas were also recorded in towns immediately west of the river, but in other parts of the infested territory the infestation was no more abundant than usual. In most of the residential sections, particularly in Massachusetts, the wintering webs are removed annually and burned by the local authorities." 1

1 Plant Quarantine and Control Administration, U. S. D. A.





SPRUCE BUDWORM

The severe infestation by the spruce budworm (Harmologa fumiferana Clem.) in the Shoshone National Forest in Wyoming has continued this year. This infestation has been under way since 1922. The large centers of infestation of the spruce budworm in central Idaho that have been so destructive during the past few years are reported as being materially reduced and no longer in an epidemic status. The outbreak which developed on the Occur d'Alene Forest in 1928 continues its destructiveness. By midsummer it developed that this insect was very prevalent over Michigan and Wisconsin. In several parts of the latter State the outbreaks were serious.

SPRUCE NEEDLE MINER

"Early this spring the work of the spruce needle miner (Epinotia nanana Treit.) was again very noticeable on spruce (red and white) along the seacoast from Orr's Island to Pemaquid, Maine, approximately 25 miles. The heaviest infestations seemed to cover small areas, sometimes less than an acre in extent. Where it was ^{abundant} plentiful the dried mined needles clinging to the twigs made the trees very unsightly. Defoliation in the heaviest infestation ranged from 35 to 75 per cent. In all the infestations visited the conditions seemed to indicate that the infestation had not been of long standing. This insect was also reported as unusually abundant and destructive in northern Illinois and southern Wisconsin." 1

SADDLED PROMINENT

The saddled prominent (Heterocampa guttivitta Walk.) appeared in outbreak numbers in the New England States where it defoliated large areas of beech and maple. This insect was accompanied by the green-striped maple worm (Anisota rubicunda Fab.) in Massachusetts and southern Vermont.

ELM LEAF BEETLE

The elm leaf beetle (Galerucella xanthomelana Schrank) again appeared in outbreak numbers throughout New England and southeastern New York State; rather severe outbreaks were reported from points in North Carolina, Ohio, and Kentucky. It was also observed to be numerous at Corvallis, Oregon, and is being a pest of major importance in the great interior valleys of California.

DARK BEETLES

What is believed to be one of the largest outbreaks of the southern pine beetle (Dendroctonus frontalis Zimm.) was reported from the Smoky Mountain National Park in North Carolina and Tennessee.

1 Forest Insect Investigations, Bureau of Entomology, U. S. D. A.

"There was a notable decrease in the activity of the western pine beetle (Dendroctonus brevicornis Lec.) in the western yellow pine stands of Oregon and Washington due to more favorable growth conditions during the past season. The epidemic in the Modoc National Forest, California, subsided to a point lower than any reached during the last six years. During the period while this decline was in progress in northern California an epidemic developed in the Southern Sierras in certain watersheds of the Sequoia National Park and in the northern part of the Sequoia National Forest and in Coulter pine near Julian, on the Cleveland National Forest. This occurred in a very limited belt of timber and the infestation was estimated to run as high as 35 per cent of the total number of trees."

"The mountain pine beetle (Dendroctonus monticolae Hopk.) continues to sweep through the lodgepole and white pine stands of the Pacific Northwest, central Idaho, and Western Montana, and practically all of the susceptible trees are doomed. The epidemic has waned in many places, having already killed over 90 per cent of the mature stands. The most active epidemics reported are now located on the Fremont, Deschutes, and Wallowa National Forests in Washington, and near the Coeur d'Alene, Kaniksu, Fend Oreille, and Kootenai National Forests and the Glacier National Park. The epidemic which has been active in Crater Lake National Park during the past 15 years is now nearly over."

"The cypress bark beetle (Ithloeosinus cristatus Lec.) has caused more than the usual amount of damage to planted Monterey, Arizona, and Lawson cypresses in central and southern California, and in Arizona. Numerous hedge and windbreak trees have been killed by the attack, and ornamental trees have been injured by the twig-pruning habit. In many infestations in the San Francisco Bay district P. dupressi Hopk. is associated with P. cristatus." 1

SCOTCH PINE LECANIUM

The Scotch pine lecanium (Toumeyella numismaticum P. & McD.), a pest which has never been previously recorded as doing any extensive injury in the forests of Wisconsin, appeared in very destructive numbers on Jack pine in many sections of the State.

CYCLAMEN MITE

The cyclamen mite (Tarsonemus pallidus Banks) attracted considerable attention in the coastal area of the San Francisco Bay district in California late in the summer by seriously infesting strawberries.

A CICADA

One of the most striking developments of the year was the discovery

1 Forest Insect Investigations, Bureau of Entomology, U. S. D. A.

of a cicada (Tibicen davisi S. & G.) seriously damaging large commercial plantings of the fern asparagus (Asparagus plumosus) in Palm Beach, Fla. The damage was occasioned by the feeding of the cicada nymphs on the roots of these plants. Adults began emerging in large numbers during early September and they oviposited very freely in the lath shade which is used in these ferneries and also in any other available objects.

A NEGRO BUG

A very unusual type of injury was observed in September in the Norfolk district of Virginia. A small black burrower bug (Panagaeus uhleri Sign.) was attacking newly sprouted spinach, killing the young plants before they pushed through the soil. They were so numerous in one field that 43 acres had to be resown.

WHITE-LINED SPHINX

One of the periodical outbreaks of the white-lined sphinx (Celerio lineata Fab.) occurred this year in parts of Wyoming, Nevada, and the Lake Tahoe district of California. Enormous numbers of the caterpillars crawling over the ground attracted considerable attention. It was also reported in unusual numbers from North Dakota. Very little damage, however, was done by these insects.

ARGENTINE ANT

The Argentine ant (Iridomyrmex humilis Mayr) continued to be one of the most annoying and injurious insect pests occurring in Mississippi. Early in the season we received records of the finding of this insect at Spartansburg, S. C., and in three of the municipal greenhouses in Baltimore, Md.

A SCARABAEID BEETLE

A scarabaeid beetle (Dolbocerosoma bruneri D. McC.) seriously damaged golf greens near Lincoln, Nebr., early in September. The damage was very similar to that occasioned by white grubs.

A CURCULIONID

The finding of Cleonus piger Scop. in Yates County, N. Y., again this year seems to indicate that this European pest is established in that State. In Europe this insect is known as a sugar-beet pest.

WALKINGSTICK

"One of our inspectors J. F. Keough, who is located at Willimantic, Conn., reports that in September, 1930, he observed a very heavy outbreak of the walkingstick, (Diantheromera femorata Say.) in woodland in Voluntown, Conn., over a hundred acres being infested. The growth consisted of 70 per cent red oak, 15 per cent white oak and the balance was a mixture of white pine, pitch pine and gray birch. The heaviest feeding was on the red oak with a smaller amount on the white oak and some on the pitch pine. No feeding was observed on white pine. Defoliation could be observed over the entire area and over about 26 acres there was from 15 to 80 per cent defoliation." 1

Corrections.

Line 1, paragraph 2, page 257, "pale western cutworm" should read "variegated cutworm."

Chalconhora liberta Germ. as given on page 429 was later determined by W. S. Fisher as C. georgiana Lec.

The species of Chrysobothris referred to on pages 27 and 112-113 was subsequently described by W. S. Fisher as C. fragariae.

The cicada, Diceroprocta viridifascia Wlk. reported on pages 259 and 309-310 was later determined as Tibicen davisi S. & G.

Insect conditions in Hawaii during 1930, reported by O. H. Swezey, Hawaiian Sugar Planters Association:

MELON FLY

Apparently the melon fly (Dactrocera cucurbitae Coq.) has been pretty well controlled by the introduced parasite Onius fletcheri Silv., for the crop of watermelons raised was the largest for a long time, and the melons were on the market for the longest season -- five or six months. Some cantaloupes were also raised this year.

ASIATIC BEETLE

There has been slight spread of the cane root grub beyond the limited district previously infested. In most of the district the grubs (Anomala

1 Forest Insect Investigations, Bureau of Entomology, U. S. D. A.

orientalis Waterh.) have been scarce this year and of no injury to the cane. However, in one plantation the grubs were found to have increased sufficiently to cause a significant reduction in cane at harvest time. Scolia manilae Ashm., which controls this beetle in most of the infested area, had failed to do so here, but after the cane was harvested Scolia gained access to the field and in due time had Anomala under control again.

ROSE BEETLE

The rose beetle (Adoretus sinicus Burm.) continues to be a general garden pest, on account of the extensive feeding of the beetles on the leaves of many kinds of ornamentals and garden plants. Scolia manilae Ashm. parasitizes the grubs to some extent but not sufficiently. Attempts in the past several years to introduce additional parasites from the Orient for Adoretus have failed.

SUGARCANE WEEVIL BORER

The status of the sugarcane weevil borer (Rhabdocnemis obscura Boisd.) has remained about the same as for the past several years, it being satisfactorily controlled by the New Guinea tachinid Ceromasia spheonophori Vill. in the majority of the plantations. However, the borer still does considerable damage in some plantations, especially where mature cane stands for several months before being harvested, and the borer is working in the canes that are covered by the accumulation of trash so the parasites do not have access to them. This damage is to be obviated by earlier harvesting of such fields. A recently introduced variety has been observed in several instances to be less attacked by borers than some other varieties growing with it.

MANGO WEEVIL

Examination of 50 mango seeds showed 80 per cent containing the mango weevil (Cryptorhynchus mangiferae Fab.). Their presence in the seeds had not impaired the mangoes for eating, but the seeds were spoiled for propagation purposes.

SUGARCANE LEAFHOPPER

The sugarcane leafhopper (Perkinsiella saccharicida Kirk.) has been satisfactorily controlled by its natural enemies almost entirely throughout the Islands. There was an outbreak on one plantation in which, in a field of about 100 acres, the leafhoppers increased to injurious numbers before being checked by their enemies. The most important enemy, Cyrtorhinus mundulus Breddin, soon increased sufficiently to check the outbreak, and in three months the leafhoppers had entirely disappeared without serious damage to the cane.

HIBISCUS INSECTS

There have been heavy infestations of some hibiscus hedges by the hibiscus whitefly (Aleyrodes hibisci Kot.), causing considerable smutty appearance. The whiteflies were considerably parasitized by Encarsia sp.. Hibiscus hedges are more and more becoming infested with Hemichionaspis minor Mask., which results in the death of the infested plants unless given prompt attention.

GREEN SCALE

The green scale (Coccus viridis Green) often badly infests Ixora and some other ornamentals. Several parasites work on it but without any beneficial control. Two ladybeetles, Azya lutipes Muls., and Cryptolaemus montrouzieri Muls., often feed on the green scale quite abundantly.

GARDEN LOOPER

The garden looper (Plusia chalcites Esp.) is now well controlled in Honolulu by the parasite Litomastix floridana Ashm., first known to have become established here in February, 1929.

RICE BORER

Rice has yielded much better than any time since the rice borer (Chilo simplex Butl.) was first known here and caused such heavy losses in the spring crop of 1928. This has apparently been the result of the establishment of three parasites on the rice borer from the Orient; an egg parasite, Trichogramma japonicum Ashm., and two larval parasites, Amyosoma chilonis Vier. and Diocetes chilonis Cush.

COCONUT LEAF ROLLER

Coconut leaves have been remarkably free from the coconut leaf roller (Omiodes blackburni Butl.) this year, so they are mostly in perfect condition as compared with the usual ragged appearance. This is undoubtedly due to several parasites, chiefly Ctenastus hymeniae Vier.

SUGARCANE LEAF ROLLER

There were only two or three slight outbreaks of the sugarcane leaf roller (Omiodes accenta Butl.) observed. Apparently the several introduced parasites have kept it well controlled.

CHINESE GRASSHOPPER

The Chinese grasshopper (Oxya chinensis Thunb.) has been spreading rapidly on the Island of Hawaii of recent years. It has been known for a long time on Oahu and Kauai, where there have been occasional fields considerably attacked, though not causing any extensive damage. The feeding on cane (causing very ragged leaves) has been chiefly along grassy roadsides and borders of fields.

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